(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 689 952 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.01.1996 Bulletin 1996/01

(51) Int. Cl.[6]: **B60J 10/00**, B60J 10/08, B60R 13/06

(21) Application number: **95303086.3**

(22) Date of filing: **05.05.1995**

(84) Designated Contracting States:
DE ES FR IT

(30) Priority: **01.07.1994 GB 9413309**

(71) Applicant: **DRAFTEX INDUSTRIES LIMITED**
Edinburgh EH3 6YY, Scotland (GB)

(72) Inventor: **Robinault, Michel**
F-44000 Nantes (FR)

(74) Representative: **Foster, David Martyn et al**
Ickenham Uxbridge UB10 8BZ (GB)

(54) Flexible sealing and trimming strips

(57) A sealing arrangement for sealing around the periphery of the door opening in a motor vehicle body comprises a relatively rigid support strip (18) of invariable length and on which is mounted a soft sealing profile (16). A plurality of clips (20) are integrally moulded with the support strip (18) and, in use, engage pre-positioned holes extending through the flange (18). A soft sealing strip (22) provides a seal between the underside of the support strip (18) and the flange (8). A cosmetic lip (26) covers the protruding distal ends of the clips (20) and also the distal edge of the flange (8). The sealing arrangement can be fitted in a substantially single operation, and the use of the substantially rigid support strip (18) prevents shrinkage of the material of the sealing arrangement (14).

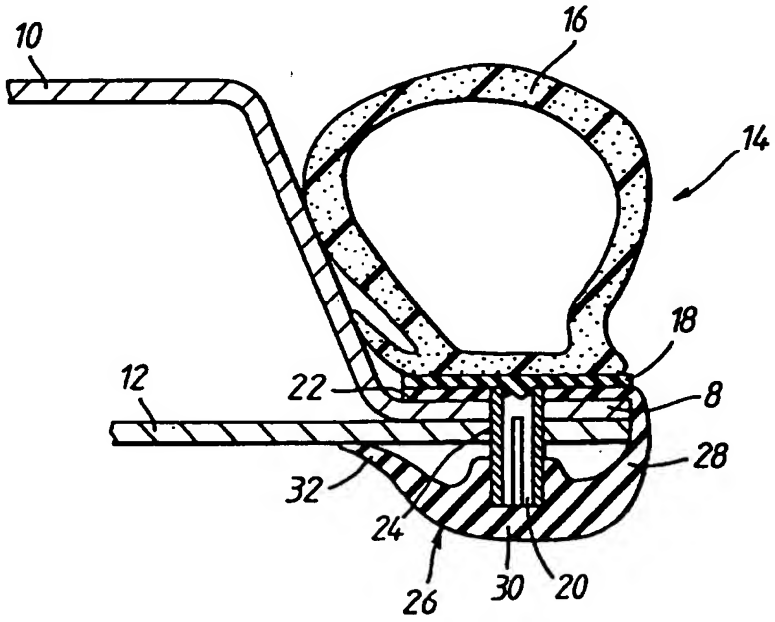

Fig.2

EP 0 689 952 A1

Description

The invention relates to flexible sealing and trimming strips. One embodiment of the invention to be described in more detail below comprises a sealing strip for sealing around a closable opening, such as a door opening, in a motor vehicle body. However, many other applications are possible.

According to the invention, there is provided a sealing arrangement for sealing around the periphery of a closable opening, comprising linearly extending support means of predetermined and substantially invariable length matching a predetermined length around the periphery of the opening, soft sealing means mounted on the support means and extending along its length, and locking means for lockably securing the support means with the sealing means thereon so as to run along the periphery of the opening, whereby the sealing means provides a seal between the periphery of the opening and a closure member for the opening.

According to the invention, there is also provided a sealing arrangement for sealing between a flange running around the periphery of a closable opening in a motor vehicle body, comprising a generally flat thin support strip of predetermined and substantially invariable length matching a predetermined length along the periphery of the opening and providing first and second oppositely directed faces, locking means for lockably attaching the first face on, and in a predetermined position relative to the said length along, the periphery of the opening of the flange, and a soft sealing profile mounted on the second face of the support strip so as to be partially compressed by the closing closure member.

According to the invention, there is further provided a sealing arrangement for sealing between a flange running around the periphery of an opening in a motor vehicle body and a closure member for the opening, comprising a generally flat support strip of predetermined and substantially invariable length and matching a predetermined length of the periphery of the opening and having first and second oppositely directed faces, continuous contact fastener means mounted on the first face and extending along the length thereof for lockingly engaging corresponding continuous contact fastener means adapted to be secured to the flange, and a soft sealing profile mounted on the second face of the support strip so as to be positioned to be partially compressed between the flange and the closing closure member.

Flexible sealing arrangements embodying the invention will now be described, by way of example only, with refeence to the accompanying diagrammatic drawings in which:

Figure 1 is a side view of part of a motor vehicle body showing a door opening to be sealed by one of the sealing strips;
Figure 2 is a cross-section through one of the sealing arrangements, showing it mounted on the vehicle body of Figure 1;
Figure 3 shows the sealing arrangement of Figure 2 but partially compressed by the closing door; and
Figure 4 shows another one of the sealing arrangements.

As shown in Figure 1, a motor vehicle body 5 has a door opening 6, the door not being shown. The bodywork around the door opening defines a flange 8 (to be described in more detail below) where the inner and outer skins of the bodywork meet and are welded together. The sealing arrangements to be described in more detail below are mounted on the flange 8 so as to run around the door opening and to present a soft sealing profile which is partially compressed by the closing door so as to provide a weather-proof seal. One such sealing arrangement is shown diagrammatically at 14 in Figure 1, ready to be fitted to the vehicle body in a manner to be described.

Figure 2 shows the flange 8 surrounding the door opening 6 of Figure 1 and formed where the adjacent body panels 10 and 12 come together at the door opening and are welded to each other.

The sealing arrangement is shown generally at 14 and is mounted on the flange 8 in a manner to be described in more detail. The sealing arrangement 14 has a tubular sealing profile 16 which is advantageously made by extrusion from sponge rubber or similar material. In a manner to be explained, it is supported so as to be attached to the flange 8 and to extend around the whole of the door opening. The sealing arrangement supports the sealing profile 16 so that it is presented towards the outside of the opening and so as to be partially compressed by the closing door 17 as shown diagrammatically in Figure 3. The partially compressed sealing profile 16 thus provides a weather-proof seal running around the door opening.

As shown in Figure 2, the sealing strip 14 includes a substantially rigid support strip 18 of thin rectangular cross-section which is advantageously produced by moulding from compact hard rubber or plastics material. The support strip 18 carries clips 20 which are positioned at intervals along the length of the strip and are advantageously produced integrally with the strip 18 during the moulding operation and from the same material.

The strip 18 carries the soft sealing profile 16. The profile 16 may be produced separately, such as by extrusion, and then adhesively secured to the strip 18. Instead, it can be produced simultaneously with the support.

In addition, the sealing arrangement 14 includes a soft seal strip 22, such as produced by moulding or extrusion from supple rubber. The seal strip 22 is of thin rectangular cross-section generally matching the cross-section of the support strip 18. The seal strip 20 is provided with through holes which are spaced apart to match the spacing of the clips 20, and the clips pass through these holes.

In accordance with a feature of the sealing arrangement, the flange 8 is provided with through holes 24 arranged at intervals around the door opening and with a pitch corresponding to the pitch of the clips 20. Figure 1 shows the flange 8 with the holes 24 arranged in it.

The sealing arrangement 14, comprising the rigid support strip 18 and the integrally moulded clips 20, and also including the soft seal strip 22 mounted thereon by means of its holes which engage the clips 20, is mounted in position by offering it up to the flange 8 in a single operation, as indicated in Figure 1. The clips 20 thus pass through the holes 24 and secure the sealing strip in position on the flange.

In this way, assembly of the sealing strip onto the vehicle body involves only a single operation. This contrasts with known arrangements in which (for example) sealing strips comprise a channel-shaped gripping section which has to be pushed embracingly over the flange and which supports a soft sealing section similar to the section 16 of Fig. 2. With such known arrangements, the channel-shaped gripping section has to be pressed onto the flange, such as by means of a mallet or possibly some other tool. This involves the application of force to the gripping section along substantially the whole of its length. This is a time-consuming process and may damage the gripping section. In addition, such a gripping section, being flexible and resilient, may not have an accurately controlled length. It may therefore have to be selected to be initially over-length (that is, longer than the periphery of the door opening), and then compressed length-wise to fit it finally into place. Subsequently, it may shrink, providing a gap.

This disadvantage is avoided with the form of sealing strip shown in Figure 2. Its length is accurately controlled by use of the rigid support strip 18. The pitch of the clips 20 is known accurately, thus enabling corresponding holes 24 to be produced in the flange 8. The length of the sealing arrangement is thua unaffected by the fitting process and is selected initially so as to match the periphery of the door opening substantially exactly.

As shown in Figure 2, the sealing arrangement 14 advantageously also includes a so-called cosmetic lip 26. This extends along the length of the arrangement 14 and covers over the distal ends of the clips 20. It has a portion 28 which covers over the distal edge of the flange 8, a main body portion 30 which clips over the distal end of each of the clips 20, and a flap 32 which resiliently contacts the inner skin 12 of the bodywork.

Advantageously, the trimming fabric on the bodywork 12 can be gripped under the edge flap 32.

The cosmetic lip 26 can be produced separately by means of a moulding or extrusion operation and held in position by resiliently gripping the distal ends of the clips 20. Instead, it can be produced integrally with the seal strip 22.

Figure 4 shows a cross-section corresponding to that of Figure 2 but through a modified form of the strip, and parts in Figure 4 corresponding to parts in Figure 2 are correspondingly referenced.

As before, the soft sealing section 16 is mounted on and attached to a substantially rigid support strip 18 produced by moulding or extrusion or other suitable process from plastics or rubber material for example. Again, the soft sealing section 16 can be adhesively secured to the support strip 18 or moulded or extruded integrally with it.

In the case of the Figure 4 arrangement, however, there are no clips 20.

In order to mount the sealing strip in position, a second longitudinally extending support strip 40 is provided, made of flexible material such as moulded or extruded plastics or rubber. The support strip 40 is secured to the flange 8 by means of adhesive. The cross-section of the support strip 40 generally matches that of the support strip 18, and both of them are sized width-wise and length-wise so as to match the shape and size of the flange 8 around its periphery.

As shown in Figure 4, the facing surfaces of the supports 18 and 40 are provided with continuous strips of contact fastener material 42 of the "Velcro" type, or other similar type operating on the same general principle, which thus engage each other, as shown in Figure 4, and secure the sealing firmly in position on the flange.

Thus, the sealing arrangement 14 can be manufactured to match the length of the flange 8 substantially exactly and secured in position by substantially a single operation, simply involving clipping the two lengths of "Velcro" together.

In the case of the Figure 4 arrangement, the cosmetic lip 26 is advantageously integral with the sealing section 16 and made of the same material or a different material.

Claims

1. A sealing arrangement for sealing around the periphery of a closable opening (6), comprising linearly extending support means (18,22,40), soft sealing means (16) mounted on the support means (18,22,40) and extending along its length, and locking means (20,42) for lockably securing the support means (18,22,40) with the sealing means (16) thereon so as to run along the periphery of the opening (16), whereby the sealing means (16) provides a seal between the periphery of the opening (6) and a closure member for the opening, characterised in that the support means is of predetermined and substantially invariable length matching a predetermined length around the periphery of the opening (6) and comprises a strip (22,40) of flexible material having one longitudinally extending face adapted to be lockably secured by the locking means (20,42), and a substantially rigid support strip (18) secured to the opposite face of the strip (22,40) of flexible material and on which the sealing means (16) is mounted.

2. A sealing arrangement according to claim 1, characterised in that the locking means comprises clip means (20) for mechanically clipping the support means (18,22,40) to the periphery of the opening (6).

3. A sealing arrangement according to claim 2, characterised in that the clip means comprises a plurality of clips (20) mounted at predetermined positions along the length of the support means (18,22,40) for engaging corresponding formations (24) along the length of the periphery of the door opening (6).

4. A sealing arrangement according to claim 3, characterised in that the clip means comprise protrusions (20) for respectively engaging holes (24) formed in the periphery of the opening (6).

5. A sealing arrangement according to claim 1, characterised in that the locking means comprises continuous contact fastener means (42) on a surface (18) of the support means and lockingly engaging corresponding continuous contact fastener means (42) adapted to be attached to the periphery of the opening.

6. A sealing arrangement according to claim 5, characterised in that the said corresponding continuous contact fastener means (42) is mounted on the said opposite face of the strip (40) of flexible material and the locking means includes adhesive for securing the said one face of the strip (40) of flexible material around the periphery of the opening (6).

7. A sealing arrangement for sealing between a flange (10,12) running around the periphery of a closable opening (6) in a motor vehicle body, comprising a soft sealing profile (16) mounted for attachment to the flange (10,12) so as to be partially compressed by the closing closure member, support means (18,22) for supporting the sealing profile (16), and locking means (20) for locking the support means (18,22,40) to the flange, characterised in that the support means comprises a generally flat thin support strip (18) of predetermined and substantially invariable length matching a predetermined length along the periphery of the opening (6) and providing first and second oppositely directed faces, and in that the locking means (20) comprises means for lockably attaching the first face of the support strip (18) on, and in a predetermined position relative to the said length along, the flange (10,12).

8. A sealing arrangement according to claim 7, characterised in that the locking means comprises a plurality of projecting clips (20) extending substantially perpendicularly to the said first face of the support strip (18) and engaging holes (24) at predetermined positions in the flange (10,12).

9. A sealing arrangement according to claim 8, characterised by a generally flat soft seal (22) matching the length of the support strip (18) and mounted on the first face of the support strip (18) so as to be sealingly interposed between that face and the flange (10,12).

10. A sealing arrangement according to any one of claims 7 to 9, characterised by a flexible covering lip (26) corresponding in length to the length of the support strip (18) and attached directly or indirectly to the support strip (18) so as to extend along the flange (10,12) on the opposite side thereof to the support strip (18) when the support strip (18) is mounted on the flange (10,12).

11. A sealing arrangement according to claim 7, characterised in that the locking means comprises a plurality of clips (20) projecting from the first face of the support strip (18) and positioned at predetermined intervals therealong so as to extend through correspondingly positioned holes (24) in the flange (10,12) and so that their distal ends protrude through the flange (10,12), and including a flexible covering lip (26) matching the length of the support strip (18) and adapted to be mounted on the opposite side of the flange (10,12) to the support strip and to cover over the protruding distal ends of the clips (20).

12. A sealing arrangement according to claim 11, characterised in that the covering lip (26) is adapted to engage the protruding distal ends of the clips (20).

13. A sealing arrangement according to claim 11 or 12, characterised by a generally flat soft seal (22) matching the length of the support strip (18) and mounted on the first face of the support strip (18) so as to be sealingly interposed between that face and the flange (10,12).

14. A sealing arrangement according to any one of claims 8,9 and 11 to 13, characterised in that the clips (20) are produced integrally with the support strip (18).

15. A sealing arrangement for sealing between a flange (10,12) running around the periphery of an opening (6) in a motor vehicle body and a closure member for the opening (6), comprising a soft sealing profile (16) mounted for attachment to the flange (10,12) so as to be partially compressed by the closing closure member, support means (18,22) for supporting the sealing profile (16), and locking means (20) for locking the support means (18,22,40) to the flange characterised in that the support means comprises a generally flat thin support strip (18) of predetermined

and substantially invariable length and matching a predetermined length of the periphery of the opening (6) and having first and second oppositely directed faces, and continuous contact fastener means (42) mounted on the first face and extending along the length thereof for lockingly engaging corresponding continuous contact fastener means (42) adapted to be secured to the flange (10,12).

16. A sealing arrangement according to claim 15, characterised in that the contact fastening means (42) adapted to be secured to the flange is mounted on a generally flat soft sealing strip (40) which generally matches the length of the support strip (18) and which is adapted to be secured to the flange (10,12).

17. A sealing arrangement according to claim 16, characterised in that the soft sealing strip (40) is adapted to be secured to the flange (10,12) by adhesive.

18. A sealing arrangement according to any one of claims 15 to 17, characterised by a flexible covering lip (26) embracing the edge of the flange (10,12) and extending over a peripheral part of the opposite side of the flange (10,12) to the support strip (18).

19. A sealing arrangement according to claim 18, characterised in that the covering lip (26) is secured to the support strip (18).

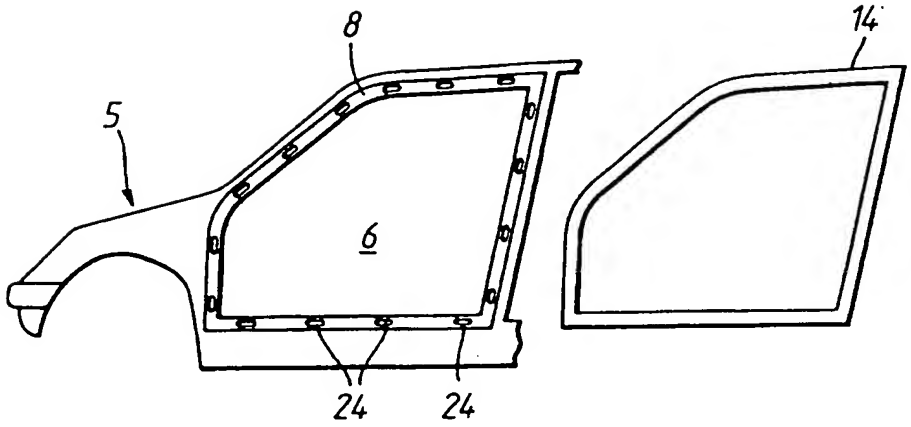

Fig.1

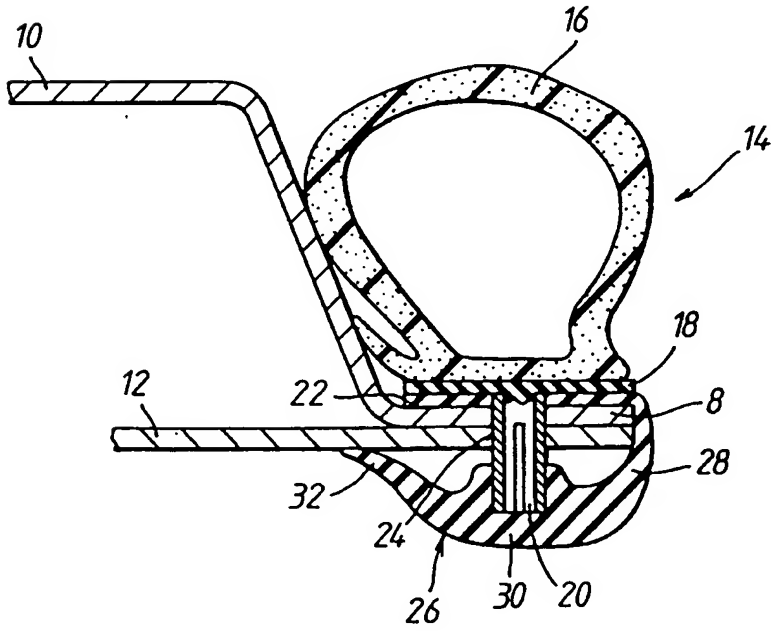

Fig.2

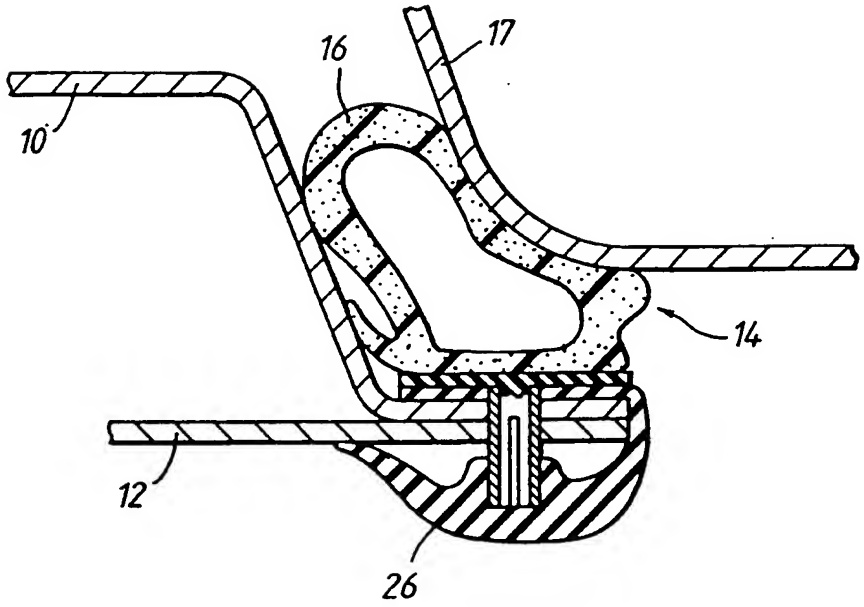

Fig.3

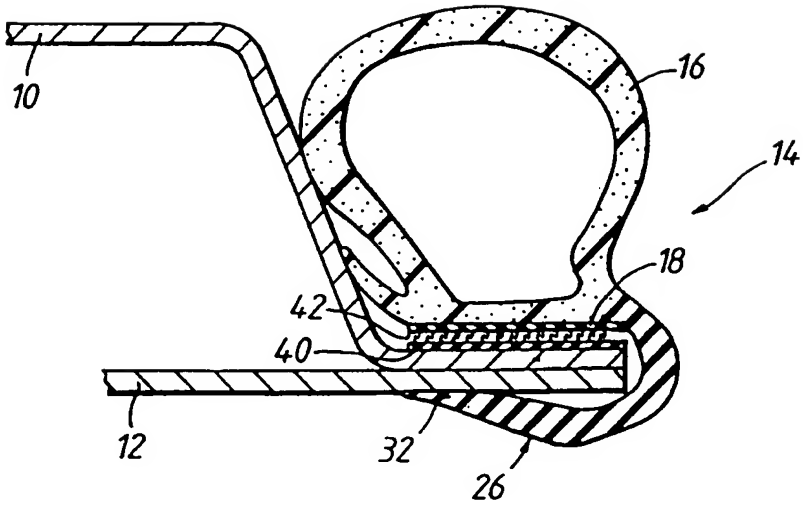

Fig.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 30 3086

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB-A-934 249 (GENERAL MOTORS) * page 2, line 109 - page 3, line 30; figures 12-19 *	1-3,7-9	B60J10/00 B60J10/08 B60R13/06
X	DE-A-42 36 817 (TOYODA GOSEI) * figure 2 *	1,7	
A	US-A-5 178 927 (D.H. TURNER) * figures 1-9 *	1	
A	DE-C-38 18 605 (DAIMLER-BENZ) * figure 1 *	1,7,10	
A	GB-A-630 062 (WORCESTER WINDSHIELDS & CASEMENTS) * figures 1-3 *	7,10	
A	FR-A-2 593 445 (AUTOMOBILES PEUGEOT & AUTOMOBILES CITROEN) * figures 1-7 *	1	
A	US-A-3 505 772 (J.H. DE CLAIRE) * figures 1-8 *	15	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B60J B60R
A	FR-A-2 141 329 (AMERICAN VELCRO) * the whole document *	15	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 October 1995	Kusardy, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)